CLAIMS:

WE CLAIM AS OUR INVENTION:

1. A voltage contrast method to determine electrical continuity between a first and a second conducting component of an integrated circuit, comprising

a. positioning said integrated circuit in relation to a first charged particle source to align said first charged particle source to direct a first beam of charged particles to strike said first conducting component;

b. positioning a second charged particle source in relation to said integrated circuit to align said second charged particle source to direct a second beam of charged particles to strike said second conducting component;

c. alternatingly pulsing said beams of said first charged particle source and said second charged particle source;

d. detecting secondary electrons from said first conducting component; and

e. evaluating the pattern of said secondary electrons to determine whether said first conducting component has electrical continuity with said second conducting component.

2. The voltage contrast method of claim 1 wherein the voltage of said first beam is less than about 2.5 kV.

3. The voltage contrast method of claim 1 wherein the voltage of said second beam is greater than about 2.5 kV.

4. The voltage contrast method of claim 1 wherein said first beam is an electron beam and said second beam is an electron beam.

5. The voltage contrast method of claim 1 wherein said first beam is an electron beam and said second beam is an ion beam.

6. The voltage contrast method of claim 1 wherein said alternatingly pulsing of said beams is directed to said first and second conducting components exposed on a cross section of said integrated circuit.

7. A voltage contrast method to determine electrical continuity between a first and a second conducting component of an integrated circuit, comprising

a. co-positioning said integrated circuit in relation to a first charged particle source and a second charged particle source so as to align both said first charged particle source to direct a first beam of charged particles to strike said first conducting component and said second charged particle source to direct a second beam of charged particles to strike said second conducting component;
b. alternatingly pulsing said beams of said first charged particle source and said second charged particle source to provide off-set receipt of said first beam and said second beam to said second conducting component, the frequency of alternate pulsing and the frequencies and intensities of the first and second beams being set so as to avoid interference between said first and second beams, said first beam producing a net negative charge when said first conducting component is not grounded and said second beam imparts a virtual ground to said second conducting component;
c. detecting secondary electrons from said first conducting component; and
d. evaluating the pattern of said secondary electrons to determine whether said first conducting component has electrical continuity with said second conducting component.

8. The voltage contrast method of claim 7 wherein the voltage of said first beam is less than about 2.5 kV.

9. The voltage contrast method of claim 7 wherein the voltage of said second beam is greater than about 2.5 kV.

10. The voltage contrast method of claim 7 wherein said first beam is an electron beam and said second beam is an electron beam.

11. The voltage contrast method of claim 7 wherein said first beam is an electron beam and said second beam is an ion beam.

12. The voltage contrast method of claim 7 wherein said alternatingly pulsing of said beams is directed to said first and second conducting components exposed on a cross section of said integrated circuit.

13. An alternating pulse dual-beam system for voltage contrast behavior assessment of integrated circuits, comprising:

a. a first charged particle source focusable on a first conducting component of said microcircuit;
b. a second charged particle source focusable on a second conducting component of said microcircuit;
c. an electron detector suitably positioned and oriented to detect electrons emitted by said first conducting component;
d. a stage for mounting a sample of said integrated circuit to be in a position to receive charged particles from said first charged particle source and said second charged particle source without a need for movement of the stage; and
e. at least one computational control device to send control signals to said first charged particle source and said second charged particle source in a manner to provide alternating pulses of first particles from said first charged particle source to said first conducting component and second particles from said second charged particle source to said second conducting component.

14. The system of claim 13 wherein the voltage of a first beam of said first particles is less than about 2.5 kV.

15. The system of claim 14 wherein the voltage of a second beam of said second particles is greater than about 2.5 kV.

16. The system of claim 15 wherein said first beam is an electron beam and said second beam is an electron beam.

17. The system of claim 15 wherein said first beam is an electron beam and said second beam is an ion beam.

18. The system of claim 13 wherein said sample is a cross section of said integrated circuit.